

What is claimed is:

1. A communication system for performing code-division multiple access communications between a mobile station and a base station, wherein:
  - said base station comprises:
    - base station receiving means for receiving signals from said mobile station and outputting a first reception signal;
    - interference canceling means for canceling a multiple access interference signal contained in said first reception signal;
    - interference cancellation effect estimating means for estimating a post-interference cancellation signal-to-interference power ratio of said first reception signal which is currently being received;
    - control command generating means for generating a power control command by comparing said post-interference cancellation signal-to-interference power ratio determined by said interference cancellation effect estimating means with a target value for power control; and
    - base station transmitting means for transmitting said power control command to said mobile station; and
  - said mobile station comprises:
    - mobile station receiving means for receiving a signal from said base station and outputting a second reception signal; and
    - mobile station transmitting means which adjusts the power of the transmission signal transmitted to said base station based on said power control command contained in said second reception signal.
2. A communication system in accordance with claim 1, wherein said target value is determined based on an error rate of decoded data obtained by decoding said first reception signal after interference cancellation.
3. A communication system in accordance with either claim 1 or 2, wherein said base station further comprises:

first signal-to-interference power ratio measuring means for determining the signal-to-interference power ratio of said first reception signal; and

second signal-to-interference power ratio measuring means for determining the signal-to-interference power ratio of said first reception signal after interference cancellation by said interference canceling means; and

said interference cancellation effect estimating means estimates the post-interference cancellation signal-to-interference power ratio for the current reception signal based on the signal-to-interference power ratio of the current reception signal obtained from said first signal-to-interference power ratio measuring means and the post-interference cancellation signal-to-interference power ratio for said first reception signal of the past obtained from said second signal-to-interference power ratio measuring means.

4. A communication system in accordance with claim 3, wherein said base station further comprises signal processing means for determining an average value of signal-to-interference power ratios corresponding to an error rate of the current reception signal based on the post-interference cancellation signal-to-interference power ratio of the current reception signal estimated by said interference cancellation effect estimating means and the post-interference cancellation signal-to-interference power ratio measured by said second signal-to-interference power ratio measuring means; and

target value setting means for updating the target value for power control based on said average value determined by said signal processing means.

5. A communication system in accordance with claim 4, wherein said target value setting means updates said target value by taking into account the current number of connections.

6. A communication system for performing code-division multiple access communications between a mobile station and a base station, wherein:

said base station comprises:

base station receiving means for receiving signals from said mobile station and outputting a first reception signal;

interference canceling means for canceling a multiple access interference signal contained in said first reception signal;

error rate calculating means for decoding said first reception signal after interference cancellation by said interference canceling means and determining an error rate of the decoded data;

first target value setting means for determining a target value for power control based on the error rate determined by said error rate calculating means;

interference cancellation effect estimating means for estimating the effects of interference cancellation by said interference canceling means;

second target value setting means for updating said target value depending on the interference cancellation effects estimated by said interference cancellation effect estimating means;

control command generating means for generating a power control command by comparing said target value outputted from said second target value setting means with the signal-to-interference power ratio of said first reception signal which is currently being received; and

base station transmitting means for transmitting said power control command to said mobile station; and

said mobile station comprises:

mobile station receiving means for receiving a signal from said base station and outputting a second reception signal; and

mobile station transmitting means which adjusts the power of the transmission signal transmitted to said base station based on said power control command contained in said second reception signal.

7. A base station device for a communication system for performing communications with a mobile station by code-division multiple access; comprising:

base station receiving means for receiving signals from said mobile station and outputting a reception signal;

interference canceling means for canceling a multiple access interference signal contained in said reception signal;

interference cancellation effect estimating means for estimating a post-interference cancellation signal-to-interference power ratio of said reception signal which is currently being received;

control command generating means for generating a power control command by comparing said post-interference cancellation signal-to-interference power ratio determined by said interference cancellation effect estimating means with a target value for power control; and

base station transmitting means for transmitting said power control command to said mobile station.

8. A base station device in accordance with claim 7, wherein said target value is determined based on the error rate of decoded data obtained by decoding said reception signal after interference cancellation.

9. A base station device in accordance with either claim 7 or 8, further comprising first signal-to-interference power ratio measuring means for determining the signal-to-interference power ratio of said reception signal; and

second signal-to-interference power ratio measuring means for determining the signal-to-interference power ratio of said reception signal after interference cancellation by said interference canceling means;

wherein said interference cancellation effect estimating means estimates the post-interference cancellation signal-to-interference power ratio of the current reception signal based on the signal-to-interference power ratio of the current reception signal obtained by said first signal-to-interference power ratio measuring means and the post-interference cancellation signal-to-interference power ratio of said reception signal of the past obtained by said second signal-to-interference power ratio measuring means.

10. A base station device in accordance with claim 9, further comprising:  
signal processing means for determining an average value for  
signal-to-interference power ratios corresponding to the error rate of the current reception signal based on the post-interference cancellation signal-to-interference power ratio of the current reception signal estimated by said interference cancellation effect estimating means

and the post-interference cancellation signal-to-interference power ratio measured by said second signal-to-interference power ratio measuring means; and

target value setting means for updating the target value for said power control based on said average value determined by said signal processing means.

11. A base station device in accordance with claim 10, wherein said target value setting means updates said target value by taking into account the current number of connections.

12. A base station device for a communication system for performing communications with a mobile station by code-division multiple access; comprising:

base station receiving means for receiving signals from said mobile station and outputting a reception signal;

interference canceling means for canceling a multiple access interference signal contained in said reception signal;

error rate calculating means for decoding said reception signal after interference cancellation by said interference canceling means and determining an error rate of the decoded data;

first target value setting means for determining a target value for power control based on the error rate determined by said error rate calculating means;

interference cancellation effect estimating means for estimating the effect of the interference cancellation by said interference canceling means;

second target value setting means for updating said target value depending on the interference cancellation effects estimated by said interference cancellation effect estimating means;

control command generating means for generating a power control command by comparing said target value outputted from said second target value setting means with the signal-to-interference power ratio of said first reception signal which is currently being received; and

base station transmitting means for transmitting said power control command to said mobile station.

13. A power control method in a communication system for performing communications by code-division multiple access between a mobile station and a base station; comprising steps of:

canceling a multiple access interference signal contained in a reception signal from said mobile station;

estimating a post-interference cancellation signal-to-interference power ratio of said reception signal which is currently being received;

generating a power control command by comparing said estimated post-interference cancellation signal-to-interference power ratio and a target value for power control; and

controlling the transmission power of said mobile station by transmitting said power control command to said mobile station.

14. A power control method in accordance with claim 13, wherein said target value is determined based on the error rate of decoded data obtained by decoding said reception signal after interference cancellation.

15. A power control method in accordance with either claim 13 or 14, further comprising:

measuring the signal-to-interference power ratio of said reception signal and measuring the signal-to-interference power ratio of said reception signal after interference cancellation, and estimating the post-interference cancellation signal-to-interference power ratio of the current reception signal based on the resulting signal-to-interference power ratio of the current reception signal and the post-interference cancellation signal-to-interference power ratio of said reception signal of the past.

16. A power control method in accordance with claim 15, further comprising:

determining an average value of the signal-to-interference power ratio corresponding to the error rate of the current reception signal based on the post-interference cancellation signal-to-interference power ratio of the current reception signal which has been estimated and the post-interference cancellation

signal-to-interference power ratio of said reception signal measured in the past, and updating the target value for said power control based on said average value.

17. A power control method in accordance with claim 16, wherein said target value is updated by taking into account the current number of connections.

18. A power control method in a communication system for performing communications by code-division multiple access between a mobile station and a base station; comprising steps of:

canceling a multiple access interference signal contained in a reception signal from said mobile station;

decoding said reception signal after said interference cancellation and determining the error rate of said decoded data, determining a target value for power control based on the determined error rate, estimating the interference cancellation effect due to said interference cancellation, and updating said target value depending on said estimated interference cancellation effect;

generating a power control command based on a comparison between said target value and the signal-to-interference power ratio of said reception signal which is currently being received; and

transmitting said power control command to said mobile station to control the transmission power of said mobile station.